The acquisition of early verbs in French: Assessing the role of conversation and of child-directed input

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Assessing the role of conversation and of child-directed speech.

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ABSTRACT

This paper examines the production of early verbs by two children acquiring French as their first language. The study focuses on the developmental period during which verbs are produced in one form only. Child-directed speech (CDS) and conversational contingencies (CC) occurring around these verbal forms were analyzed up to the moment when some verbs are produced in two different forms. Results show that children's use of a single form per verb can also be found in CDS by adults where the majority of verbs are used in one phono-morphological form only. Moreover, the particular form children use for a given verb corresponds to the one adults predominantly use in CDS. At the same time, child-produced verb forms are reinforced in the CC occurring in adult-child exchanges. When trying to pull apart the role of CCs from that of more general CDS, for both children we find that for about half of the verbal forms CDS and CC provide the same congruent information. Of the remaining verb types, three quarters are explained by CC, while less then 15% are explained by CDS, indicating that conversational contingencies are a stronger source of influence than general input. These findings underline the close relationships among patterns of language acquisition, conversational exchanges and child-directed speech. The data suggest a construction process based on specific characteristics of the language children hear, what they can produce and, importantly, the temporally close reinforcing relations between these two that are forged in conversational interactions.

Many detailed studies of the acquisition of early verbs have shown that at first children produce verbs in one form only. This is not only the case among children learning languages with limited inflectional morphology like English (Tomasello, 1992), but also in children learning languages with rich inflectional morphology, such as Hebrew, Turkish, Italian, Spanish, Polish, Greek and Serbo-Croatian (Berman & Lotem, 1996; Aksu-Koç, 1988; Gathercole, Sebastian & Soto, 1999; Pizzuto & Caselli, 1994; Armon-Lotem & Berman, 2003). It is also the case of children learning French (Kilani-Schoch, 2000; Laaha et al., 2007; Veneziano, 1999; Veneziano & Sinclair, 2000), a language with moderate inflectional morphology and thus somewhat intermediate between the two (e.g., Dressler, 2007). This does not mean that children use only one morphological form for all the verbs they produce but that *different* forms are used for *different* verbs. In English, for example, the adult verb TO CLOSE may be produced only as '*closed*' while TO OPEN may be produced only as *'open'*. Since there is a single form per verb, there is no evidence for morphological knowledge yet, and the form used might just be the child's rendition of the lexical target. Later, when children start producing at least two morphologically different forms of the *same* verb, (e.g. *closed* and *close* - what Dressler (2007) calls the first minimal mini paradigms), questions concerning verb inflectional morphology can be addressed and theories making different predictions can start to be evaluated (e.g., Shirai, Slobin and Weist, 1998).

The aim of this paper is twofold. The first is to examine factors that may explain why children start producing verbs in a single form. The second aim is to investigate in detail the particular form in which verb targets are produced during this period. Why are certain verbs rendered in a given form and other verbs in another? For example, why does the child use /ka'se/ (to break/broken) for the verb CASSER 'to break' and /tuʀn/ (turn/turns) for the verb TOURNER 'to turn'?

In respect of the first aim, we examine verb forms produced in child-directed speech (CDS). The morphology of French is simpler than that of other highly inflected languages (e.g., Dressler, 2007) and the morphology of oral French is even simpler than that of written French because of extensive homophony by which many inflections 'exist for the eyes only' (Largy, Ganier, Dédéyan, & Fayol, 2005). However, oral French can still be considered to have a rather rich verb morphology with structured paradigms allowing for more than 20 morphologically distinguishable non homophonous forms (see next section). This raises issues regarding children's early verb learning and the sources of their data. Are children confronted with the potentially available array of orally distinguishable inflected forms or is this variation greatly reduced in CDS? CDS is known to present a simplified version of the adult language in terms of vocabulary, syntax and phonological structure. Relative to adult-to-adult speech, caregivers' utterances are shorter, contain less third person pronouns, compound verbal forms and subordinate clauses (e.g., Gallaway & Richards, 1994; Snow, 1995; Veneziano, 2000). More specifically, for verb forms in French CDS, recent work suggests that CDS is greatly skewed towards the use of verbs in one phonological form (Laaha et al. 2007; Veneziano & Parisse, 2005). Hence, we might expect that, at first, children, hearing verbs produced dominantly in one phonological form, generalize the single-form also to verbs occurring in more then one form, using in all cases one unanalyzed form to express the meaning attributed to the corresponding lexical item.

In respect of the second aim, two main types of analyses were performed. The first considers the relation between verb forms produced in CDS and children's renditions of the corresponding verbs. Earlier studies show that the frequency and the pattern of occurrence of words in CDS influences the composition of children's vocabulary. Correspondences between children's language and CDS are found concerning the proportion of nouns and verbs produced (Gopnick & Choi, 1990; Choi & Gopnik, 1995; Tardif, Shatz, & Naigles, 1997), the

contexts in which words are used (Harris, Barrett, Jones, & Brookes, 1988), the meaning of novel words (Clark & Grossman, 1998), and the use of certain forms (Cameron-Faulkner, Lieven, & Tomasello, 2003). For verbs, Aksu-Koç (1998) finds a correspondence between the distribution of different inflections found in the child's speech and that in the mother's, while Naigles and Hoff-Ginsberg (1998) find a relation between the place verbs occur in mothers' utterances and the range of syntactic frames they appear in, and the order of acquisition of first verbs by the children. Here we expect a correspondence between the specific verb forms produced by the children and the verb forms used most or most consistently in speech directed to them.

The second analysis is more fine-tuned and takes into account the conversational contingencies (CC) occurring around each of the verb forms produced by the children, when the child's verbal form preceded, followed, or both preceded and followed the adult's production of that verb. In this way, adult-child correspondences between verbal forms are captured in the here and now flow of occurrence, at a time when the child's attention is focused on the meaning of what is expressed, and likely to bear on the adult's verbal production and on the relationship between the two. Indeed, it has been often found that it is in the context of interaction through adult's expansions, reformulations, corrections e.g., (Clark & Chouinard, 2003; Farrar, 1990; Saxton, 2000, 2005), through children's uptakes and imitations (Masur & Eichorst, 2002; Snow, 1987; Nelson, Baker, Denninger, Bonvillian & Kaplan, 1985), and most importantly in conversations characterized by mutual attention and responsiveness that CDS has its most predictive power (Tomasello & Farrar, 1986; Tomasello & Todd, 1983; Veneziano, 1988, 2005). In conversational contingencies children are focused on the meanings to be expressed and on the possible relationships between meanings and forms. The analyses of conversational contingencies centered on verb forms will offer another important source of data to understand the specific form the child produces for a given verb.

We believe it will offer also a determining factor to understand the thrust towards inflectional variation.

Taken together, and intersecting the findings obtained from CDS and from the analysis of verb-centered conversational contingencies, these two analyses illuminate the relative role of general CDS and of specific, contextually-situated and meaning-loaded, conversational contingencies in predicting the form for each of the verbs produced during the single-form period.

In the study to be reported here, after a brief overview of the verb system of French, we present 1) developmental data on the production of verbs by two French-acquiring children to verify the existence and determine the extent of the single-form verb morphology in these participants, and 2) developmental data on verb production in the speech directed to the two children during the longitudinal study. Then, for each verb produced by the two children during the single-form period, 3) the relationship between the form(s) used in the speech directed to each child and the form used by the children, 4) the profiles of conversational contingencies in which the children's forms are involved, and 5) the combined profile of occurrence of the form in CDS speech and in conversational contingencies. These analyses enable us to provide insights to children's acquisition of early verbs in French.

VERB MORPHOLOGY IN FRENCH

French verbs belong to one of 3 main conjugations. First and second conjugations regroup regular verbs. All first conjugation verbs end in ‘er’ in the infinitive and contain the great majority of French verbs (5676 types, 88% of the verbs listed in the "Lexique" database, New, Pallier, Ferrand, & Matos, 2001). Second conjugation verbs regularly end in ‘ir’ in the infinitive and in /isã/ in the present participle (e.g., "finir" 'to finish') and are few in number (331 types, 5% of the verbs listed in the same source). Also third conjugation verbs are few

(440 types, 7% of the verbs; New et al.), all of them being irregular. The infinitive of these verbs end in -oir, -re (-oire, -dre, -tre, -uire), and include the irregular verbs whose infinitive end in –ir, as well as the irregular verb ALLER, the only irregular verb with an infinitive ending in -er.

In written French, verbal bound morphology is rather rich. 52 forms, expressing person, number, and tense, can be distinguished. Although oral French is simpler because many of these forms are homophonous, there are still more then 20 morphologically distinguishable forms. We distinguish in this article morphological from morphophonological forms of a verb. By morphophonological form - referred hereafter as 'phonological form of verb morphology' (PFVM) -, we refer to a verb form that might stand for several morphologically distinguishable grammatical forms that are homophonous in the language. Annex 1 presents the difference between PFVMs and morphological forms by presenting the correspondences for the two most used PFVMs for 1st conjugation verbs, illustrated by the verb CASSER, 'to break'. These are the PFVM /ka'se/, corresponding to 9 morphological functions (the non finite forms of the infinitive, and past participle and to the finite forms of the 2nd person plural of the present indicative and imperative), and the PFVM /kas/, corresponding to 8 morphological functions (the 1st and 2nd person singular of the Present Indicative and Subjunctive modes, the 3rd singular and plural, and the present imperative). In first conjugation verbs, these two PFVMs represent 17 different morphological functions. To capture these highly frequent morphological functions, second and some third conjugation verbs (like "écrire" 'to write', "dire" 'to say', "cuire" 'to cook') also need two PFVMs which group however differently the morphological functions (a PFVM, e.g. /finir/ 'to finish', corresponding to the infinitive, and a PFVM, e.g., /fini/ 'finished', corresponding to the present imperative, to the 1st, 2nd and 3rd person singular of the present indicative and subjunctive, and to the past participle). Other third conjugation verbs need three PFVMs to

express the same span of morphological functions (a PFVM , e.g., /-rə/ as in “attendre”, for the infinitive; a PFVM, e.g., /-y/ for “attendu”, for the past participle; and a PFVM, e.g. -ø, as in “attend”, for the imperative, the 1st, 2nd, 3rd person singular (and sometimes plural) of the present indicative and subjunctive).

METHOD

Participants

The data presented here come from longitudinal studies of two mother-child dyads living in Geneva, Switzerland. In one dyad the child was a girl (Camille) and, in the other, the child was a boy (Gael). Camille was the second-born child of two children, her brother being about three years older, while Gael was the first and only child at the time of recording. The social background of the two families can be considered middle-class. The language spoken at home was French. In this paper we cover developmentally similar periods for the two children, chronologically displaced because the girl’s language development proceeded from an earlier age; hence, the periods covered were: 1;3 to 2;2 for Camille and 1;7 to 2;3 for Gael. At the beginning of the study the children had only a few recognizable words in their lexical repertoires; by the end of the study, both children produced mainly multiword utterances, and these contained recognizable grammatical morphemes (articles, prepositions, auxiliaries and pronouns). Nine sessions for each child have been analyzed for the purposes of the present study (see Table 1 for the detailed ages at the time of the analyzed sessions).

- Insert Table 1 about here -

DATA COLLECTION AND TRANSCRIPTIONS

Children were observed at home for about one hour every two weeks, during naturally-occurring interaction with familiar partners, particularly the mother and at times one of the observers. The sessions were video recorded. An independent audio recording was also

made. Videos were made with a shoulder-held camera to follow the child as he/she moved about. The sessions included spontaneously occurring free play activities (e.g., block construction, playing ball, ritual games, puzzles, manipulation of objects, etc.), book reading, symbolic play and, sometimes, snack/coffee around the kitchen table. Two observers (including the first author) were present, taking turns at filming and note-taking, while sitting out of the way of the activities, generally assuming a friendly, non-intrusive attitude, but responding when solicited by the child. The sessions were transcribed by one person (one of the observers) and were checked by two other persons (the other observer and a third person). Disagreements were generally resolved during joint repeated listening/viewing of the tapes. Children's speech was transcribed in IPA; adult speech, in conventional French orthography. Transcripts are in CHAT format and have been recently linked to the videorecordings.

METHOD OF DATA ANALYSIS

Analysis of PFVMs in children's verbal productions

Children's lexical productions interpreted as verbs in French were analyzed. For each verb, the number of PFVMs produced during each session was determined. If a verb was produced in one PFVM only, for example, /ka'se/, the corresponding verb type was considered to have only one PFVM (S-PFVM for single PFVM); instead, if a verb was produced in two PFVMs (for example both as /kas/ and /ka'se/) it was considered to have two PFVMs (M-PFVM for multiple PFVMs). To minimize underestimation due to sampling limitations, the coding was also applied across sessions. Thus, if the child produced /kas/ at one session and /ka'se/ at a subsequent session, at this last session the verb CASSER was considered to present M-PFVM. When a verb type occurred only imitatively in two different PFVMs, or imitatively in one PFVM and spontaneously in another PFVM, the across-section criterion for M-PFVM didn't apply. This is the case of three verb types for Camille (CHERCHER 'to find', OUVRIR 'to open'

and PLEURER 'to cry'). Verb types for which no clear PFVM could be identified were counted as verb types but they were left undetermined concerning the type of PFVM produced, and thus it was not decided whether the verb was produced in one or more PFVMs. This was the case for one verb type (OUVRIR 'to open') in Gael's production.

At each session, the cumulative number of verb types (number of types at the previous sessions + number of NEW types at the session under analysis) and the proportion of types occurring in two (or more) PFVMs, at the same session, or across sessions, will be reported.

Analysis of PFVMs in child-directed speech

For each session, all verbs occurring in CDS were identified and for each verb type the number of different PFVMs produced was noted. For example, if for the verb type CASSER, the forms /ka'se/ and /kas/ were found, the verb type would be considered as occurring in two PFVMs.

When more than one PFVM for the same verb type was encountered, the relative weight of each form was calculated by taking into account their relative frequency of occurrence. For verb types occurring in two PFVMs, one form was considered 'dominant' if it occurred 75% or more of the times; for verb types occurring in three or more PFVMs, one form was considered dominant if it occurred 60% or more of the times. The verb was considered to have no dominant PFVM in all other cases. Further distinctions in the occurrence of PFVMs in CDS were made for those verb types that were also produced by the children (see next section).

Analysis of the relation between PFVMs used in CDS and in children's production

To determine the relationship between verb form usages in CDS and the particular S-PFVM used by the children for each individual verb, for each child-produced S-PFVM we considered whether it corresponded to: (a) the exclusive or dominant PFVM used in CDS (75% or more of the occurrences of the verb type); (b) the PFVM used in the majority of

cases (more than 60% and less than 75% of the occurrences of the verb type); (c) the minority PFVM of a verb type that has a major PFVM (less than 40% but more than 25% of the occurrences of the verb type); (d) the non dominant PFVM of a verb that occurs in a dominant form in CDS (25% or less of the occurrences of the verb type). For example, during the child's S-PFVM period, in CDS the verb PIQUER 'to sting' occurs dominantly as "pique" /pik/ (sting(s)) (83% of the occurrences). As the child's S-PFVM is /pik/ 'pique', PFVM used by the child corresponds to the dominant PFVM used in CDS.

All the children's S-PFVMs and all the PFVMs of the corresponding verbs occurring in CDS during the single-morphology verb period were analyzed in this way, including verbs produced in S-PFVM at the session when the single-morphology verb period was considered to dwindle.

Analysis of the conversational contingencies between child's and adult's verbal forms

To evaluate the specific role of conversational exchanges independently from the more general influence of the input, every PFVM produced by the children was analyzed for the conversational context in which it occurred. In particular, starting with the first occurrence of a child-produced PFVM, we coded the whole sequence of adjacent turns, as long as that verb type was produced by either the child or the adult. Children's PFVMs that were preceded, followed, or both preceded and followed, by an adult's PFVM of the same verb type were distinguished from those that were not so surrounded. In the former case, for each adjacent pair, we noted whether the PFVM produced by the partner was the same or different from the one produced by the child, and whether the "sameness" or the "discrepancy" relation was established by the child or by the adult. For verbs with final /R/, the child's PFVM was considered to present a "sameness" relationship with the adult's PFVM whether the child's presented a final /R/ or not. Four verb types were concerned: BOIRE /bwaR/) 'to drink', SORTIR /soRtiR/) 'to get out', DORMIR (/doRmiR/) 'to sleep' and ECRIRE (/ekRiR/) 'to write'.

For each PFVM, the overall pattern of conversational contingencies was classified into one of 4 profiles: a) CC++, when the child's PFVM followed or was followed exclusively or dominantly (at least 75% of the adjacent conversational contingencies) by the *same* PFVM of the partner; b) CC+, when the child's PFVM followed or was followed in the majority of the cases (between 60 and 75% of the adjacent conversational contingencies) by the *same* PFVM of the partner; c) CC-, when the child's PFVM followed or was followed in the majority of the cases by a *different* PFVM of the partner, or evenly by two PFVMs of that verb; d) CCo, when none of the child's PFVM of a verb followed or were followed by a PFVM of the partner.

Combining CDS and Conversational contingencies information

Combining the verb profiles in CDS (see above) with the conversational contingencies profiles (preceding section), we obtain 16 potential categories in which to fit each child-produced S-PFMV (see Table 2). For each category, the first value refers to the profile of the verb type in CDS as follows: a) CDS++ : the verb occurs in one or in a dominant PFVM; b) CDS+: the verb occurs, the majority of the cases, in a particular PFVM; c) CDS-: no PFVM dominates in CDS; d) CDSo, the verb type is not found in CDS. The second value refers to the profile of the conversational contingencies surrounding each child's PFVM, as described above: a) CC++; b) CC+; c) CC- and d) CCo. These potential categories can be grouped into four main profiles (see Table 2) each capturing a different source of major influence on the child-produced PFVM : a) convergent influence of both CDS and CC; b) dominant influence of CC; c) dominant influence of CDS; d) influence of neither CDS nor CC.

- Insert Table 2 about here -

RESULTS

THE DEVELOPMENT OF VERB-BOUND MORPHOLOGY

The number of verb types produced by the children are few at the beginning of the investigation and increases during the period under study. For Camille, we observe a first increase around 1;6 and for Gael between 1;10 and 1;11. These developmental profiles are similar to those reported for other longitudinal studies of French-acquiring children (e.g. Bassano, 2000; Bassano, Laaha, Maillochon, & Dressler, 2004; Laaha et al, 2007), with Camille being somewhat in advance.

Both children show a period in which verb targets are produced in only one form (S-PFVM) (see Table 3).

- Insert Table 3 about here -

In this period, the S-PFVMs of first conjugation verb targets occur either in the infinitive/past participle form (/ka'ʃe/ 'to hide', 'hidden'), or in the present indicative/imperative form (/sot/ 'jump(s)'). S-PFVMs of irregular verbs (third conjugation verbs) are produced either in the past participle/imperative (/a'si/ 'sit', 'seated'), the present indicative/imperative (/kuʀ/ 'run'; /mɛ/ 'put'; /ta/ 'hold it'; /tã/ 'wait'), past participle/present indicative and imperative (/fɛ/ 'make(s)/made'), or the present indicative form /va/ 'go(es)'. As can be seen in Figure 1 (1a et 1b), when verb types per session are still few in number, before 1;6 for Camille and 1;10 for Gael, there is a slight preference for the present indicative/imperative PFVM for Camille and a preference for the infinitive/past participle PFVM for Gael. Subsequently, verb types are produced rather evenly in one or the other S-PFVM.

- Insert Figure 1 (1a et 1b) about here -

For Camille, the single-form verb morphology period lasts until 1;9.3. At this session, out of the 21 verb types produced, four clearly occur in two different PFVMs: ENLEVER 'to remove, HABILLER 'to dress up', SAUTER 'to jump', TOURNER 'to turn'. These are all first conjugation verbs and are produced both in the infinitive/past participle PFVM *and* in the

present indicative/imperative PFVM: respectively, /əve/ and /ɛv/; /abije/ and /abij/, /sote/ and /sot/, /tuʀne/ and /tuʀn/. To the exception of ENLEVER, the second PFVM occurs in an imitative context, immediately after the partner had produced it. For Gael, the single form verb morphology period lasts until 1;11;15 (see footnote i). At this session, Gael produced three verb types in M-PFVM: CACHER 'to hide', CHERCHER 'to look for' and RANGER 'to put away'. As for Camille, these verbs are all first conjugation verbs and were produced in the infinitive/past participle PFVM *and* in the present indicative/imperative PFVM: respectively, /kaʃe/ and /kaʃ/; /ʃɛrʃe/ and /ʃɛrʃ/, /ʀãʒe/ and /ʀãʒ/.

After this time, M-PFVM for some of the verbs is always observed. At 2;2.6 the cumulative measures indicate that 34% of the verb types in Camille's repertoire have been used in more than one PFVM; the comparative measure for Gael at the last observational session is 21%.

It is interesting to note that both children produce multiple phonological forms of this kind only for verbs (not for nouns). Moreover, when M-PFVM occurs, other signs of differentiation between nouns and verbs are noted, in particular the differential production of *fillers* in initial position (Veneziano, 2003; Veneziano & Sinclair, 2000).

VERB MORPHOLOGY IN CHILD-DIRECTED SPEECH

As can be seen in Figure 2, in the speech directed to the two children, the majority of the verb types occur in one PFVM only.

- Insert Figure 2 about here -

In Gael's CDS, the average proportion over sessions is 70% (sd=3.0, range: 67.5-77%). Many of the verbs presenting two (or more) different forms occur in a *dominant* PFVM (see method section). The average proportion of verbs occurring in one form or in a dominant PFVM is 81% (sd=3.0, range: 77-85%). Similar results are found in Camille's CDS. The mean proportion of verb types occurring in one PFVM only is 67% (sd= 5.1, range: 59-77%), a

proportion that raises to 79% (sd=4.4, range: 72-85%) when the verbs presenting two (or more) different forms with a *dominant* PFVM are added. The majority of the verbs used belong to the completely regular first conjugation verbs (61% of the verb types in Gael's CDS and 59% of those in Camille's CDS). Third conjugation verbs are the second most represented types of verbs (38% in Gael's CDS and 40% in Camille's CDS). Very few verbs of the second conjugation are used (between 1 and 3% in Gael's CDS; between 0 and 3% in Camille's CDS).

The proportion of verbs produced in one or in a dominant PFVM is equally high in all conjugations (81% of first and 78% of third conjugation verbs in Gael's CDS; 78% for both in Camille's CDS). For first conjugation verbs, the first and second PFVMs listed in Annex 1 (ø, and -e) occur most frequently (96% of the types and 92% of the occurrences in Gael's CDS, and 98% for both types and occurrences in Camille's CDS). Second conjugation verbs (like "finir" 'to finish', "remplir" 'to fill", "choisir" 'to choose') and some third conjugation verbs (like "écrire" 'to write', "dire" 'to say', "cuire" 'to cook') also present themselves in one or another of two PFVMs: ending in /iʀ/ (proper to the infinitive) or in /i/. This is the case for 94% of the types and 89% of the occurrences in Gael's CDS. The respective figures for Camille's CDS are 91% and 83%. Third conjugation verbs are more varied. In the speech directed to Gael and to Camille, 90% and 91% of the types occur in one of the following PFVMs, either alone or in combination: (i) the PFVM for the infinitive (/ʀə/ as in "attendre (to wait); /waʀ/ as in "assoir" (to sit); /iʀ/ as in "courir" (to run)); (ii) the PFVM for the past participle (/y/ for "attendu" (waited), "couru" (runned), /i/ for "assis" (sit)) and (iii) the PFVM corresponding to the imperative, the 1st, 2nd, 3rd person singular of the present indicative, and sometimes the 3rd person plural.

The analyses performed on the speech children hear while interacting with mature speakers show that the morphological variation allowed by the non homophonous forms of

French verbs is greatly reduced, most verb types presenting themselves in a single or in a dominant PFVM. This characteristic of CDS is likely to influence the S-PFVM period. As most verbs encountered in the input present themselves in a single or a very frequent form, children might neglect at first the phonomorphological variations present in French verbs and render verb words with one unique form.

RELATION BETWEEN CHILDREN'S S-PFVMS AND VERB USAGES IN CDS

Concerning the relationship between the way each verb type is produced in CDS and the particular single PFVM produced by the children, Table 4 shows that 64% of the PFVMs produced by Camille and 80% of those produced by Gael in the single-form period correspond to the dominant or majority forms of the relative verbs in CDS. Respectively 15% and 5% correspond to non dominant or minority forms, and 21% and 15% correspond to verbs that occur rather evenly in different PFVMs and thus do not present a dominant or majority form. For verbs that are produced in CDS in a dominant or a majority PFVM, children produce significantly this dominant or majority form (for Camille: chi square (1, N=66) =24.24, p<< .001; for Gael: chi square (1, N=34) =23.05, p<< .001).

- Insert Table 4 here -

Table 5 shows in particular the PFVMs children produce for first conjugation verbs. When the dominant or majority form in CDS is the infinitive/past participle PFVM, children produce this PFVM 90% and 100% of the time, for Camille and Gael, respectively; when the dominant or majority form in CDS is the present indicative/imperative PFVM, they produce this PFVM 82% and 80% of the time, respectively. Instead, when the verb occurs as much in one as in the other form, they produce the infinitive/past participle PFVM, 80% (Camille) and 100% (Gael) of the time.

- Insert Table 5 here -

Both children appear thus to be strongly influenced by the frequency with which a particular form occurs in CDS. In the absence of a marked tendency in CDS, children seem to prefer the infinitive/past participle form for first conjugation verbs.

Do the close correspondences between children's and adult's PFVM depend only from general input frequencies of occurrence or are they also, or more specifically, linked to the conversational contingencies into which the forms are embedded? This is the question tackled in the next section.

RELATION BETWEEN ADULT'S AND CHILD'S PFVMS IN CONVERSATIONAL CONTINGENCIES

The immediate conversational contingencies of each occurrence of the children's S-PFVMs were analyzed to determine whether the child and the adult produced the same PFVMs when talking about jointly attended events. The overall profile for each child-produced verb was determined assigning each verb type to one of the following four conversational profiles (see also §4 of the Method section): a) CC++, when the child's PFVM was always or dominantly produced in a conversational context where the partner and the child produced the same PFVM of the verb (at least 75% of the conversational contingencies); b) CC+, when the child's PFVM was produced in the majority of the cases (between 60 and 74% of the contingencies concerning that verb); c) CC-, when the child's PFVM was produced in the majority of the cases in a conversational context where the partner's and the child's PFVM were *different*, or there were as many contingencies of the "same" and of the "different" kind; and d) CCo, when none of the child's PFVM were conversationally linked to a partner-produced PFVM of that verb.

Table 6 shows that 80% (see footnote ii) of the S-PFVM produced by Camille (35 verb types) are mostly or exclusively preceded and/or followed by the same PFVM (CC++), 97% of them presenting exclusively a sameness relation; 7% of her S-PFVM present a CC+ profile and 5% a profile CC-, the majority of the occurrences of these S-PFVMs being

preceded and/or followed by a different partner-produced PFVM. The remaining 9% of Camille's verbs are never involved in conversational contingencies where the partner produces a PFVM of the corresponding verb.

- Insert Table 6 here -

The data for Gael are quite similar. Among the 20 verb types produced as S-PFVM during his single-form verb morphology period, 90% are preceded or followed by the same partner-produced PFVM, all but one presenting exclusively a sameness relation. 5% of the child's S-PFVM (1 verb type: cacher 'to hide') present a profile CC- and the remaining 5% (aller 'to go') is never involved in conversational contingencies with a PFVM of the corresponding verb.

To summarize, the results of the conversational contingency analysis show that the particular S-PFVM the child produces has strong correspondences not only with the way verb types are produced in CDS but also with the adjacent and intimate relations built up while the partners converse about particular meanings.

INTEGRATING CDS AND CC INFORMATION

To determine the relative role of CDS input and of CC relations in the child's production of particular PFVMs, their relative weight has been combined, giving rise to four different profiles where the dominant influence is that of CDS, of CC, of both or doesn't seem to come from either source (see §5 of Method of analysis and Table 2 above). Table 7 presents, for each child, the number of S-PFVMs corresponding to each of these four profiles.

- Insert Table 7 here -

Although the overall number of verbs is different for the two children, their distribution into the different profiles is very similar. Respectively 55% and 50% of the S-PFVMs produced by the children fall into a profile where dominance in CDS *and* "sameness" in CC converge (the first row in Table 7). These S-PFVMs are not helpful in determining the

relative role of CC or of CDS in the children's production of the specific PFVM. 35% and 36% of the S-PFVMs produced respectively by Gael and Camille correspond to a profile where "sameness" in conversational contingencies dominates over the occurrence of the corresponding PFVM in CDS (second row in Table 7). Only 5% and 7% of the PFVMs (respectively for Gael and Camille) are explained more by frequency of occurrence in CDS than by the regularity in "sameness" relation in CC (third row in Table 7). For S-PFVM falling in profiles where dominance in CDS *and* "sameness" in CC does not converge, CC explains 78% of the S-PFVMs produced by Gael and 73% of those produced by Camille, while CDS explains respectively only 11% and 14% of these S-PFVMs. These results indicate that conversational contingencies explain the particular S-PFVMs produced by the children more than CDS does. The remaining 5% and 7% of the S-PFVMs (respectively for Gael and Camille) cannot be explained either by use in CDS or by sameness relations in CC. For the first conjugation verb CACHER 'to hide', Gael produces the infinitive/past participle PFVM /kaʃe/. However, neither conversational contingencies nor input frequencies orient the child towards this particular PFVM: in CDS the verb type CACHER occurs evenly as /kaʃ/ and /kaʃe/ (50% of occurrences for each PFVM) and the child-produced S-PFVM is linked in conversational contingencies to both /kaʃe/ (60%) and /kaʃ/ (40%), as illustrated in the following example of conversational exchange:

Child: kaʃe

Mother: tu *caches* dans le cornet? Gael il *cache* ? you hide in the bag? Gael he hides'

Child: kaʃe

Mother: *cach/e/* Gael, hein ' hidden/to hide Gael, yes'

Given the context the mother, while recognizing the general meaning expressed by the child ('hiding'), responds with the morphological form that indicates ongoing action and repeats it inserting it first in a direct address ('tu caches?' "you hide") and then in an indirect third person sentence ('il cache' "he hides"). Nonetheless, the child repeats the same PFVM he started with and the mother ends up picking up the child's form but is unable to integrate it into a contextually-meaningful, grammatical sentence.

For Camille, this profile concerns three verb types: AIDER 'to help', DESCENDRE 'to get down' and LIRE 'to read'. For all these three verbs the child produces the present indicative/imperative PFVM (/ɛd/, 'aide', "help(s)"; /sã/, 'descend', "get down" and /li/, 'lit', "read(s)"). For AIDER and LIRE, the child's PFVMs are the minority PFVM in CDS and are never involved in conversational contingencies; for DESCENDRE, the child's PFVM occurs evenly with another PFVM in CDS (/desãdu/, 'descendu', "got down") and is related more often to this PFVM than to the child-produced /desã/, 'descend', "get down".

Thus, when neither conversational contingencies nor input frequencies orient the child towards one particular PFVM, Camille produces the present indicative/imperative PFVM and Gael the past participle/infinitive PFVM. Individual preferences (found also in the development of verb morphology in other studies too, e.g., Shirai, 1998), in the absence of clearly oriented directions from CDS or from CC, seem to emanate from individual constructs. In these two particular cases they correspond to the PFVMs used most by each child when each of them first produces verbs.

DISCUSSION

The morphology of French is simpler than that of highly inflected languages. However, even though oral French is even simpler because of extensive homophony, it allows for more than 20 morphologically distinguishable non homophonous verb forms. Nevertheless, for several months, the two children studied here produce verb words in one

phonomorphological form only (S-PFVM), as they do for words that play the role of nouns and adverbials and which are practically invariable in French oral language. In this respect, these children behave as other children learning French or other more inflected languages (Berman & Armon-Lotem, 1996; Aksu-Koç, 1988; Gathercole et al., 1999; Kilani-Schoch, 2000; Laaha et al., 2007; Pizzuto & Caselli, 1994; Veneziano & Sinclair, 2000). For Camille, this period starts changing at 1;9.3, for Gael at 1;11;15.

Why do children neglect for an extended period of time the variation of verbal inflectional morphology? The speech directed to the children during this period provides at least a partial answer to this question. Our results show that morphological variation allowed by the orally non homophonous forms of French verbs is greatly reduced in CDS. The majority of the verbs present themselves in one or in a highly dominant PFVM. Thus, the overall impression children may derive from their early experience of French verbs is that they have only one form. We suggest that children may at first neglect the variation that is nevertheless present in the input reducing the case of verbs to that of other, mostly invariable, words like nouns. For each verb in their repertoire, children retain the dominant PFVM to express the verb meaning. This explanation would complement a semantic-pragmatic explanation according to which children suppose unique relations between form and meaning (Clark, 1987; Markman, 1989). For verbs, they would consider that only one form is required to express the meaning of the verb (e.g., Aguirre, 2003). Alternatively, the limited morphological variation found in this early period might be due to perceptual and/or articulatory reasons. Children may not perceive the subtle differences among different inflections or, if they do, have difficulties in reproducing them. Perceptual problems may not be a leading factor at this stage, as the data available on early speech perception (e.g., Jusczyk, Houston & Goodman, 1998) and young children's sensitivity to small inflectional variations (Soderstrom, White, Conwell, & Morgan, 2007) indicates. The explanation linked

to production difficulties needs to deal with the fact that both children produce different PFVMs for different verbs. This is well illustrated by first conjugation verbs for which the two main PFVMs are produced by each child: for example, the PFVM used for CACHER is /kaʃe/, and for TOURNER is /turn/. If production variables are involved in the particular S-PFVM produced for each verb, these must imply complex interactions between the verbs' phonological structure and morphological inflections.

During the single-form verb morphology period these children produce essentially the present indicative/imperative PFVM and the infinitive/past participle PFVM in about equal proportions (except for an initial preference for the present indicative/imperative PFVM for Camille and for the infinitive/past participle PFVM for Gael). Thus, for verb types and individual verb choices, we do not find a developmental progression from present indicative/imperative to infinitive/past participle forms, implying a development from less marked to more marked morphology (e.g., Bassano, 2000:554). How to explain the kind of form produced for each verb type? Analysis of CDS provides some insights. During the single-form verb morphology period, the PFVM that occurs most frequently in CDS explains 64% and 80% of the PFVMs produced by Camille and Gael respectively. The relationship appears clearly with first conjugation verbs. When the dominant or majority form in CDS is the infinitive/past participle, children tend to produce this PFVM, and vice versa when the dominant or majority form in CDS is the present indicative/imperative PFVM. However, when in CDS the verb occurs as much in one as in the other form, children tend to produce the infinitive/past participle PFVM, a result that confirms that markedness is not a leading variable in the choice of the S-PFVM of early verbs by French-acquiring children. It should be noted that the preference for the infinitive/past participle PFVM in cases where the input doesn't provide a leading orientation doesn't reflect an overall greater use of this PFVM in

CDS: for first conjugation verbs, the infinitive/past participle PFVM occurs 41% and 47%, respectively in Gael's and Camille's CDS.

An even stronger influence than general CDS comes from the conversational exchanges in which the children's PFVMs are involved. When CDS and CC data are combined, and considering the profiles where the influence of CDS and of CC is not equally strong, dominant sameness relations between the child's and the adult's PFVMs explain a greater proportion of S-PFVMs than dominance of the form in CDS: sameness in CC alone explains 75% of the S-PFVMs, while dominance in CDS alone explains less then 15% of these forms. Relations established in conversational contingencies are thus much more powerful than general input in orienting and stabilizing children's specific productions. This finding provides support to the approach that considers mutual attention and participation in conversational exchanges an important source of influence on child's language acquisition (e.g., Masur & Eichorst, 2002; Saxton, 2000, 2005; Snow, 1987, Tomasello & Todd, 1983; Veneziano, 1988, 2005). Indeed, conversational contingencies provide temporally close reinforcing relations at a time when the child's attention is focused on the verb form either because s/he has just uttered it or because s/he is in the process of uttering it after the partner's production, and when the relation between the form and its meaning has contextual and/or discourse anchoring.

Only a small percentage of S-PFVMs do not appear to be related to CDS, nor can they be explained by sameness relations in CC. For these forms, Gael produces the infinitive/past participle PFVM (/kaʃe/) and Camille produces the present indicative/imperative PFVM. These individual preferences correspond to the preferred PFVMs of the early verbs for each child. They seem to constitute child-constructed patterns. The reasons for their individual preferences have not been directly addressed in this paper and remain to be fully understood.

The cases in which adults continue using the verb proposed by the child but produce it in a different PFVM, as in the example presented earlier, or introduce the verb in the conversation with a PFVM that is different from the child's S-PFVM, although not very frequent in our data, are quite interesting and should be considered more fully in future research. Undoubtedly mothers mostly use PFVMs whose meanings are appropriate to the contexts of use, be they the same or different from the PFVMs produced by the children. The cases of discrepancies present inflectional variation of the same verb in close contiguity and at a time when meanings can be inferred. The close association of the established S-PFVM with a different and more appropriate PFVM appears to provide children valuable opportunities towards the beginnings of morphological variation.

Finally, it should be noted that in this paper we have dealt only with children's production. At the time children produce S-PFVM they might be sensitive to inflectional differences in comprehension. For a fuller understanding of the overall picture, it would be desirable to carry out, in parallel with production studies of this sort, comprehension studies assessing clearly children's capacity to attribute different meanings to different PFVMs of the same verb, a capacity closer to the one expected in early natural production and more complex than showing preference for grammatically appropriate usage of verb inflections (e.g. Soderstrom *et al*., 2007).

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FOOTNOTES

i At the previous session there is only one attested M-PFVM. The verb CACHER 'to hide', used until then as /ka'ʃe/ 'to hide' or ' hidden', was produced also as /kaʃ/ 'hide' or 'hides'.

ii Percentages are rounded and do not add necessarily to 100%.

Annex 1 - Correspondences between the two most frequent PFVMs and their morphological functions for the 1st conjugation verb CASSER 'to break'

PFVM	Morphological functions (Mfun)	Orthographic forms	Use of the PFVM and ratio between PFVM and Morphological Functions
/kas/	Indicative and Subjunctive Present 1st, 3rd sing.; Imperative 2nd sing	*casse*	Highly frequent
	Indicative and Subjunctive Present 2nd sing	*casses*	1 PFVM/ 9 MFun
	Indicative and Subjunctive Present 3rd plural	*cassent*	
/'ka'se/	Infinitive	*casser*	Highly frequent
	Past participle. masc. sing.,	*cassé*	
	fem. sing.	*cassée*	1PFVM / 8 Mfun
	masc. plural	*cassés*	
	fem. plural	*cassées*	
	Indicative, Subjunctive Present and Imperative 2nd plural	*cassez*	

Table 1 : Age of the two children at the sessions analyzed

Camille		Gael	
Session no.	"age at session"	session no.	"age at session"
2	1;3.16	7	1;7.23
5	1;4.26	9	1;9,0
7	1;5.23	11	1;9.20
9	1;6.22	13	1;10.17
11	1;7.18	14	1;11.1
13	1;8.15	15	1;11,15
14	1;9.3	16	1;11.25
15	1;10.12	17	2;1.0
16	2;2.6	18	2;3.4

Table 2: Main source of influence on child-produced phonological forms of verb morphology (PFVMs)

A. Convergent influence of CDS and CC
1. CDS++ CC++
2. CDS+ CC+
B. Dominant Influence of CC
3. CC++ CDSo
4. CC++ CDS-
5. CC++ CDS+
6. CC+ CDSo
7. CC+ CDS-
C. Dominant Influence of CDS
8. CDS++ CCo
9. CDS++ CC-
10. CDS++ CC+
11. CDS+ CCo
12. CDS+ CC-
D. Influence of neither CDS nor CC
13. CDS- CC-
14. CDS- CCo
15. CDSo CC-
16. CDSo CCo

Table 3: The development of verbal bound morphology in the children

Camille	1;3.16	1;4.26	1;5.23	1;6.22	1;7.18	1;8.15	1;9.3	1;10.12	2;2.6
Verb types at session	3	3	15	19	13	18	21	26	25
no of M-PFVM at session	0	0	0	0	0	0	4	10	10
%M-PFVM /Types at session	0	0	0	0	0	0	19	38	40
Verb types CUM	3	5	17	29	34	38	46	55	62
no of M-PFVM CUM at session	0	0	0	0	0	0	4	12	21
%M-PFVM CUM/ CUM Types	0	0	0	0	0	0	9	22	34

Gael	1;7.23	1;9	1;9.20	1;10.17	1;11.1	1;11,15	1;11.25	2;1.0	2;3.4
Verb types at session	7	7	5	14	8	17	19	16	22
no of M-PFVM at session	0	0	0	0	1	3	2	5	2
%M-PFVM /Types at session	0	0	0	0	13	18	11	31	9
Verb types CUM	7	13	14	20	21	28	40	45	56
no of M-PFVM CUM at session	0	0	0	0	1	4	5	10	12
%M-PFVM CUM/ CUM Types	0	0	0	0	5	11	13	22	21

Table 4: Relation between S-PFVM produced by the children and frequency of occurrence of the PFVM in CDS during the child's single PFVM (S-PFVM) period

Camille until 1;9.3

	The child's S-PFVM corresponds to the PFVM that in CDS is:			
	Dominant or Majority PFVM	NonD or Non M	Balanced	Total
Child's S-PFVM	27	6	9	42
% of corresponding S-PFVM	64	14	21	

Gael until1;11.15

	The child's S-PFVM corresponds to the PFVM that in CDS is:			
	Dominant or Majority PFVM	NonD or Non M	Balanced	Total
Child's S-PFVM	15	2	3	20
% of corresponding S-PFVM	75	10	15	

Table 5: Relation between child's and CDS PFVM in first conjugation verbs during the child's S-PFVM period

Camille until 1;9.3

		Dominant or Majority PFVM in CDS			Balanced PFVMs in CDS	
		inf/pp	indpr/imp	Tot	inpp=ipr	%inf/pp and indp/imp PFVMs by child
Child's	inf/pp	9	2	11	4	80%
"Verbs"	indpr/imp	1	9	10	1	20%
Total		10	11	21	5	
% of D or M CDS PFVM by child		90%	82%			

Gael until1;11.15

		Dominant or Majority PFVM in CDS			Balanced PFVMs in CDS	
		inf/pp	indpr/imp	Tot	Inpp=ipr	%inf/pp and indp/imp PFVMs by child
Child's	inf/pp	4	1	5	3	100%
"Verbs"	indpr/imp	0	4	4	0	0%
Total		4	5	9	3	
% of D or M CDS PFVM by child		100%	80%			

Table 6: Conversational contingencies between children's and adults' PFVM for the occurrences of each verb type produced by the children during the S-PFVM period in the development of children's verb morphology

CAMILLE				GAEL			
1. CC++: Child and adult PFVM are exclusively or DOMINANTLY the same (75% or more of the CCs)							
35 out of 44		80%		18 out of 20		90%	
approx translation	Verb types	"child's S-PFVM"	% of "sameness" relation in CC	approx translation	Verb type	"child's S-PFVM"	% of "sameness" relation in CC
to buy	acheter	|e| achet/e/	100	to hook	accrocher	accroch/e/	100
to go	aller	va	100	to sit	assis	/i/ ass/i/	100
to sit	assoir	/i/ ass/i/	100	to wait	attendre	ø attend	100
to wait	attendre	ø ,attends	100	to drink	boire	boire/ boit	100
to drink	boire	boire/ boit	100	to break	casser	cass/e/	100
to block	boucher	/e/ bouch/e/	100	to find	chercher	/e/ cherch/e/	100
to hide	cacher	/e/ cach/e/	100	to hide	donner	/e/ donn/e/	100
to break	casser	/e/ cass/e/	100	to break	écrire	/i/ekri/ekrir	100
to find	chercher	/e/ cherch/e/	100	to do	"faire"	fɛ	100
to stick	coller	ø colle	100	to leave	laisser	/e/ laiss/e/	100
to lie down	coucher	/e/ couch/e/	100	to eat	manger	/e/ mang/e/	100
to run	courir	ø court	100	to go up	monter	/e/ mont/e/	100
to sleep	dormir	dormir/dormi	100	to bring	porter	/e/ port/e/	100
to remove	enlever	/e/ enleve/e/	100	to bang	taper	ø tape	100
to close	fermer	ferme - ferm/e/	100	to hold	tenir	tiens	100
to glide	glisser	ø glisse	100	to fall	"tomber"	/e/ tomb/e/	90
to play	jouer	/e/ jou/e/	100	to turn	tourner	ø tourne	100
to eat	manger	/e/ mang/e/	100	to want	vouloir	v2	100
to put	metre	ø met	100				
to blow (nose)	moucher	/e/ mouch/e/*	100				
to leave	partir	ø part	100				
to sting	piquer	ø pique	100				
to cry	pleurer	/e/ pleur/e/	100				

to bring	porter	ø porte	100	
to push	pousser	/e/ pouss/e/*	100	
to look	regarder	ø regarde	100	
to jump	sauter	ø saute	80	
to smell	sentir	ø sent*	100	
to ring	sonner	ø sonne	100	
to get out	sortir	Sortir- sorti	100	
to hold	tenir	tiens	100	
to pull	tirer	ø tire	100	
to fall	tomber	/e/ tomb/e/	100	
to touch	toucher	/e/ touch/e/	100	
to see	voir	Vu	100	
2. CC+: Child and adult PFVM are, in the MAJORITY of the cases, the same (between 55 et 74% of the CCs)				
3 out of 44		7%		
to spit	cracher	|e| crach/e/	67	
to open	ouvrir	ouvrir	71	
to turn	tourner	ø tourne	70	
3. CC- : Child and adult PFVM are even or in the minority of the cases, the same (less then 55% of the CCs)				
2 out of 44		5%		1 out of 20 5
to get down	descendre	ø descend	33	to hide cache r /e/ cach/e/ 40
to walk	marcher	/e/ march/e/	50	
4. CCo : The child 's PFVM is never involved in a conversational continbency relation				
4 out of 44		9%		1 out of 20 5
to help	aider	ø aide	0	to go aller/ va 0
to leave	laisser	ø laisse	0	
to read	lire	ø lit	0	
to come	venir	viens	0	
Unclassifiable				
to listen	écouter			to open ouvrir

Table 7: S-PFVM produced by the child during the single.form verbal morphology period according to the relative influence of CDS and CC, per child

CAMILLE		GAEL	
A. Dominant Influence of CDS			
1. CDS++ CCo 2. CDS++ CC- 3. CDS++ CC+			
4. CDS+ CCo 5. CDS+ CC-			
3 out of 44	7%	1 out of 20	5%
laisser	ø laisse	aller/	va
venir	viens		
marcher	/e/ march/e/		
B. Dominant Influence of CC			
6. CC++ CDSo 7. CC++ CDS- 8. CC++ CDS+			
9. CC+ CDSo 10. CC+ CDS-			
16 out of 44	36%	7 out of 20	35%
aller	va	chercher	/e/ cherch/e/
assoir	assis	donner	/e/ donn/e/
casser	/e/ cass/e/	"faire"	fait
chercher	/e/ cherch/e/	laisser	/e/ laiss/e/
coller	ø colle	manger	/e/ mang/e/
dormir	dormir/dormi	monter	/e/ mont/e/
enlever	/e/ enleve/e/	tourner	ø tourne
fermer	ferme - ferm/e/		
manger	/e/ mang/e/		
mettre	ø met		
ouvrir	ouvrir		
partir	ø part		
pousser	/e/ pouss/e/*		
sauter	ø saute		
toucher	/e/ touch/e/		
voir	vu		
C. Convergent influence of CDS and CC			
11. CDS++ CC++ 12. CDS+ CC+			
22 out of 44	50%	11 out of 20	55%
acheter	|e| achet/e/	accrocher	accroch/e/
attendre	ø ,attends	assis	/i/ ass/i/
boire	boire/ boit	attendre	ø attend
boucher	/e/ bouch/e/	boire	"undiff bwar/bwa at 17"
cacher	/e/ cach/e/	casser	cass/e/
coucher	/e/ couch/e/	écrire	écri(s,t)
courir	ø court	porter	/e/ port/e/
cracher	|e| crach/e/*	taper	ø tape
glisser	ø glisse	tenir	tiens
jouer	/e/ jou/e/	"tomber"	/e/ tomb/e/
moucher	/e/ mouch/e/*	vouloir	veu(x,t)

piquer	ø pique
pleurer	/e/ pleur/e/
porter	ø porte
regarder	ø regarde
sentir	ø sent*
sonner	ø sonne
sortir	sortir- sorti
tenir	tiens
tirer	œ tire
tomber	/e/ tomb/e/
tourner	ø tourne

D. Influence of neither CDS nor CC

13. CDS-CC-	14. CDS CCo	15. CDSo CC-	16. CDSo CCo
3 out of 44	7%	1 out of 20	5%
aider	ø aide	cacher	/e/ cach/e/
descendre	ø descend		
lire	ø lit		

Table 8: S-PFVMs explained by both CDS and CC, dominantly by by CDS, dominantly by conversational contingencies or by none of the two for Gael and Camille during the single form verb period

	CAMILLE		GAEL	
Child's form is explained by	no of verb forms	%	no of verb forms	%
A. both CDS and CC 1. CDS++ CC++ 2. CDS+ CC+	22	50	11	55
B. dominantly by CC 3. CC++ CDSo 4. CC++ CDS- 5. CC++ CDS+ 6. CC+ CDSo 7. CC+ CDS	16	36	7	35
C. dominantly by CDS 8. CDS++ CCo 9. CDS++ CC- 10. CDS++ CC+ 11. CDS+ CCo 12. CDS+ CC-		7	1	5
neither by CDS nor by CC	3	7	1	5
Total	44		20	

Figure 1: Distribution of child-produced S-PFVM for verb types during the single-form verb morphology period

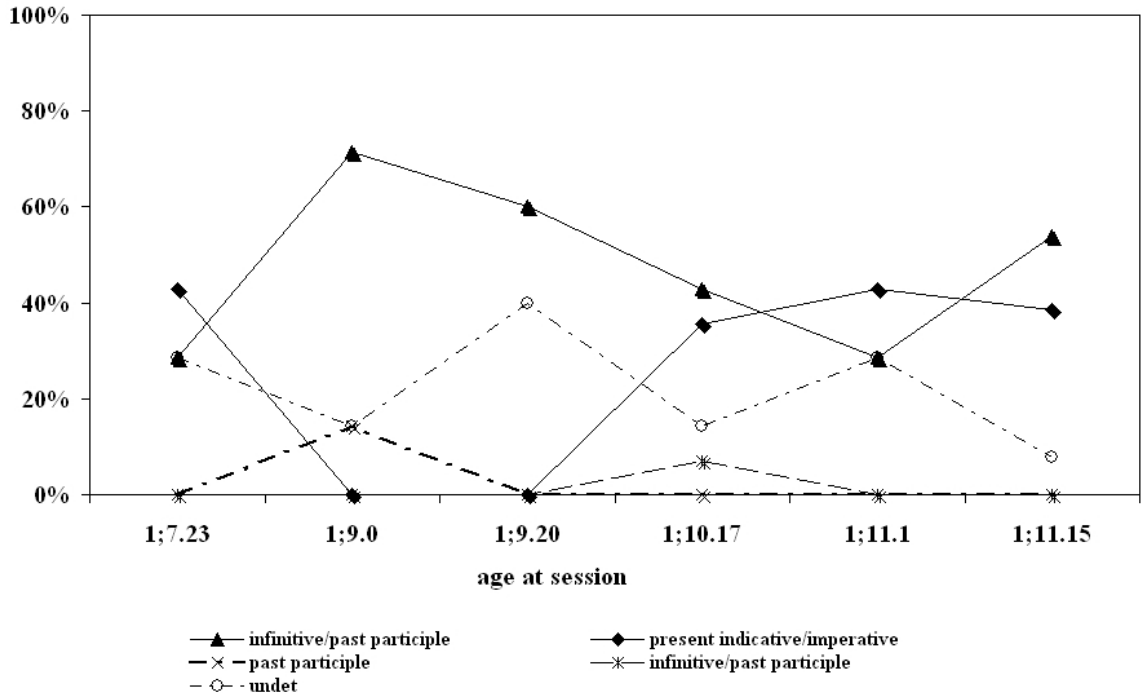

Figure 1a: Distribution for Camille

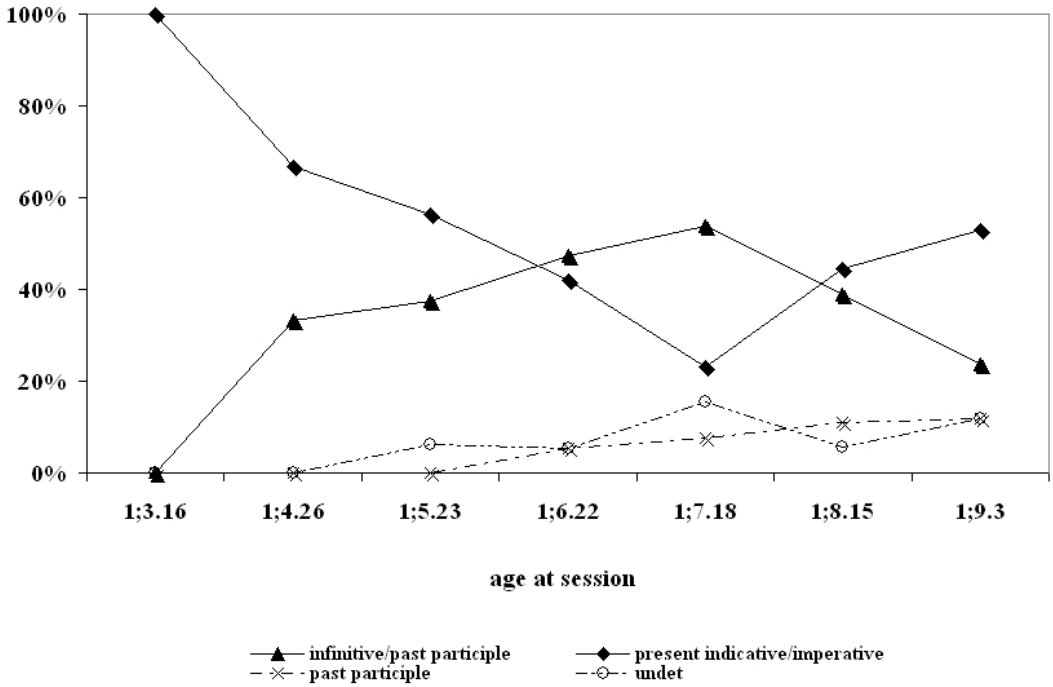

Figure 1b: Distribution for Gael

Figure 2: % of verb types produced in S-PFVM or in S-PFVM and 2PFVM with a dominant form in the CDS of Camille (left) and Gael (right)

C. Convergent influence of CDS and CC
1. CDS++ CC++ 2. CDS+ CC+